CLAIMS

We claim:

1. A method comprising:

    parsing a search query to produce parsed concepts and keywords;

    matching the parsed concepts and keywords to frequently asked questions;

    conducting keyword searching on the keywords; and

    returning results of the matching and the keyword searching.

2. A method as recited in claim 1, wherein the parsing comprises natural language parsing.

3. A method as recited in claim 1, wherein the parsing comprises:

    segmenting a search query into individual character strings;

    producing a parse tree from parsable character strings of the search query; and

    outputting keywords based on non-parsable character strings of the search query.

4. A method as recited in claim 1, wherein the matching and the conducting are performed concurrently.

5.   A method as recited in claim 1, further comprising identifying answers associated with the frequently asked questions that match the parsed concepts and keywords.

6.   A method as recited in claim 1, further comprising presenting the results in a user interface.

7.   A method as recited in claim 1, further comprising logging the search query and the results.

8.   A method as recited in claim 1, further comprising:

logging the search query in a database, the database containing many search queries; and

ascertaining frequently asked questions based on the search queries logged in the database.

9.   A method as recited in claim 1, further comprising:

identifying answers associated with the frequently asked questions that match the parsed concepts and keywords; and

presenting the answers to a user for confirmation as to which answers represent the user's intention in the search query.

10.   A method as recited in claim 9, further comprising:

logging the search query and the answers confirmed by the user in a log database; and

analyzing the log database to derive weighting factors indicating how relevant the frequently asked questions are to the parsed concepts and keywords.

11. A method as recited in claim 9, further comprising:

logging the search query and the answers confirmed by the user in a log database; and

analyzing the log database to derive weighting factors indicating how relevant the answers are to the frequently asked questions.

12. A method as recited in claim 1, wherein the parsing is performed by a natural language parser, and further comprising:

logging the search query in a database; and

training the natural language parser based on search queries logged in the database.

13. A method as recited in claim 1, further comprising deriving a confidence rating indicating how probable the results pertain to the search query.

14. A computer readable medium having computer-executable instructions that, when executed on a processor, perform the method as recited in claim 1.

15. A method comprising:

segmenting a query into individual character strings; and

processing the character strings to produce at least one of (1) a fully-parsed output, (2) partially-parsed fragment, and (3) one or more keywords.

16.   A method as recited in claim 15, wherein the segmenting comprises forming a lattice of all possible character strings that may be segmented from the query.

17.   A method as recited in claim 15, wherein the segmenting comprises forming a reduced set of all possible character strings that may be segmented from the query.

18.   A method as recited in claim 15, wherein the processing comprises parsing the character strings using natural language parsing.

19.   A method as recited in claim 15, further comprising matching the fully-parsed output to a set of frequently asked questions.

20.   A method as recited in claim 15, further comprising matching the partially-parsed fragment to a set of frequently asked questions.

21.   A method as recited in claim 15, further comprising conducting a keyword search using the one or more keywords.

22.   A computer readable medium having computer-executable instructions that, when executed on a processor, perform the method as recited in claim 15.

23.   A method comprising:

parsing a query to produce at least one of (1) a fully-parsed output, (2) partially-parsed fragment, and (3) one or more individual keywords;

in an event that a fully-parsed output or a partially-parsed fragment is produced, matching the fully-parsed output or the partially-parsed fragment to questions and identifying answers associated with the questions; and

in an event that the one or more keywords are produced, conducting a keyword search on the one or more keywords.

24.   A method as recited in claim 23, further comprising assigning weighting factors to indicate how relevant the questions are to the fully-parsed output or the partially-parsed fragment.

25.   A method as recited in claim 23, further comprising assigning weighting factors to indicate how relevant the answers are to the questions.

26.   A method as recited in claim 23, further comprising presenting the answers to a user for confirmation as to which of the answers represent the user's intentions in the query.

27.   A method as recited in claim 26, further comprising:

analyzing the query and the answers confirmed by the user; and

modifying the answers that are returned in response to the query based on information gleaned from the analyzing.

28.   A method as recited in claim 23, wherein the parsing is performed by a natural language parser and further comprising evaluating the query, the fully-parsed output and the partially-parsed fragment to train the natural language parser.

29.   A computer readable medium having computer-executable instructions that, when executed on a processor, perform the method as recited in claim 23.

30.   A method comprising:

parsing a query to produce a partially-parsed fragment;

matching the partially-parsed fragment to one or more questions; and

identifying answers associated with the one or more questions.

31.   A method as recited in claim 30, further comprising assigning a weighting factor indicative of how likely each question pertains to the partially-parsed fragment.

32.   A method as recited in claim 30, further comprising assigning a weighting factor indicative of how likely each answer corresponds to the one or more questions.

33.   A method as recited in claim 30, further comprising deriving a confidence rating indicating how probable the answers pertain to the query.

34.   A method as recited in claim 30, further comprising presenting the answers to a user for confirmation as to which of the answers represent the user's intentions in the query.

35.   A method as recited in claim 34, further comprising:
analyzing the query and the answers confirmed by the user; and
modifying the answers that are returned in response to the query based on information gleaned from the analyzing.

36.   A computer readable medium having computer-executable instructions that, when executed on a processor, perform the method as recited in claim 30.

37.   A method comprising:
receiving a query;
mapping the query to from a query space to a question space to identify associated frequently asked questions;

mapping the questions from the question space to a template space to identify associated templates;

mapping the templates from the template space to an answer space to identify associated answers; and

returning the answers in response to the query.

38.   A method as recited in claim 37, wherein the mapping from the query space to the question space comprises:

parsing the query to identify at least one associated concept; and

correlating the concept to one or more frequently asked questions.

39.   A method as recited in claim 37, wherein the mapping from the question space to the template space comprises cross-indexing from a first table containing question identifications to a second table containing templates identifications.

40.   A method as recited in claim 39, wherein the mapping from the template space to the answer space comprises cross-indexing from the second table to a third table containing answer identifications.

41.   A method as recited in claim 37, further comprising:

presenting the answers to a user for confirmation as to which of the answers represent the user's intentions in the query;

analyzing the query and the answers confirmed by the user; and

modifying the answers that are returned in response to the query based on information gleaned from the analyzing.

42.   A computer readable medium having computer-executable instructions that, when executed on a processor, perform the method as recited in claim 37.

43.   A method comprising:

receiving a query;

returning multiple possible answers to the query;

receiving user confirmation of at least one of the possible answers; and

logging the query, the possible answers, and the user confirmation.

44.   A method as recited in claim 43, wherein the returning comprises:

parsing the query to produce at least one parsed concept;

matching the parsed concept to one or more questions; and

identifying the possible answers as being associated with the one or more questions.

45.   A method as recited in claim 44, further comprising assigning a weighting factor indicative of how likely each question pertains to the parsed concept.

46.   A method as recited in claim 44, further comprising assigning a weighting factor indicative of how likely each answer corresponds to the one or more questions.

47.   A method as recited in claim 44, further comprising deriving a confidence rating indicating how probable the possible answers pertain to the query.

48.   A method as recited in claim 43, further comprising:

analyzing the query, the possible answers, and the user confirmation; and

modifying the possible answers that are returned in response to the query based on information gleaned from the analyzing.

49.   A computer readable medium having computer-executable instructions that, when executed on a processor, perform the method as recited in claim 43.

50.   A search engine comprising:

a parser to parse a query using natural language parsing and produce at least one parsed concept or keyword;

a question matcher to match said at least one parsed concept or keyword to at least one possible answer; and

a keyword searcher to search for other possible answers based on the keyword.

51. A search engine as recited in claim 50, wherein the parser produces at least one of (1) a fully-parsed output, (2) partially-parsed fragment, and (3) one or more keywords.

52. A search engine as recited in claim 50, wherein the parser comprises:

a segmentation module to segment the query into individual character strings;

a natural language parser to parse certain character strings that are parsable and leave the non-parsable character strings unparsed, the natural language parser outputting a parse tree; and

a keyword searcher to identify keywords in the query and to output the keywords.

53. A search engine as recited in claim 50, wherein the question matcher comprises:

a database;

multiple tables stored in the database to hold information pertaining to concepts, questions, and answers; and

a matching module configured to correlate, via the tables, the concepts with the questions and the questions with answers.

54. A search engine as recited in claim 53, wherein the tables further hold weighting factors that indicate how relevant the questions are to the concepts, and how relevant the answers are to the questions.

55. A search engine as recited in claim 50, further comprising a user interface to present the possible answers returned from the question matcher and the keyword searcher.

56. A search engine as recited in claim 50, further comprising:

a user interface to present the possible answers returned from the question matcher and the keyword searcher to a user for confirmation regarding which of the answers represent the user's intentions in the query;

a query analyzer to evaluate the query, the possible answers, and the answers confirmed by the user.

57. A search engine as recited in claim 50, further comprising a query log to log the query and the possible answers.

58. A search engine as recited in claim 50, further comprising:

a query log to log the query and the possible answers; and

the parser being trained from data in the query log.

59. A search engine comprising:

a user interface to facilitate entry of a natural language query string;

a natural language parser to parse the query string and output at least one of a fully-parsed output, partially-parsed fragment, and one or more individual keywords.

60.   A search engine as recited in claim 59, wherein the natural language parser comprises:

a segmentation module to segment the query string into individual character strings;

a natural language parser to parse certain character strings that are parsable and leave the non-parsable character strings unparsed, the natural language parser outputting a parse tree; and

a keyword searcher to identify keywords in the query and to output the keywords.

61.   A search engine as recited in claim 59, further comprising a question matcher to match the fully-parsed output to a set of frequently asked questions.

62.   A search engine as recited in claim 59, further comprising a question matcher to match the partially-parsed fragment to a set of frequently asked questions.

63.   A search engine as recited in claim 59, further comprising a keyword searcher to conduct a keyword search using the one or more keywords.

64.   A parser for a search engine, comprising:

a segmentation module to segment a query into individual character strings;

a natural language parser to parse certain character strings that are parsable and leaving the non-parsable character strings unparsed, the natural language parser outputting a parse tree; and

a keyword searcher to identify keywords in the query and to output the keywords.

65.   A data structure stored on a computer readable medium, comprising:

a concept-question table to hold information pertaining to searchable concepts and correlating the searchable concepts with associated search questions that may be used to discover the searchable concepts;

a question table to hold information pertaining to the search questions and correlating the search questions with associated answers that may be presented to a user in response to a query;

at least one answer table to hold information pertaining to the answers; and

the concept-question table, the question table, and the answer table being interrelated such that identification of a searchable concept leads to identification of one or more answers corresponding to the searchable concept.

66.   A data structure as recited in claim 65, wherein the concept-question table also holds a weighting factor indicating how relevant each search question is to the searchable concept.

67.   A data structure as recited in claim 65, wherein the question table also holds a weighting factor indicating how relevant each answer is to the search question.

68.   A computer-readable medium having computer-executable instructions that, when executed, direct a computer to:

parse a search query using natural language parsing to produce parsed concepts and fragments;

match the parsed concepts and fragments to frequently asked questions;

identify answers associated with the frequently ask questions; and

return results of the matching to a user for confirmation as to which of the answers represent the user's intentions in the query.

69.   A program as recited in claim 68, further comprising computer-executable instructions that, when executed, direct a computer to:

identify keywords from the search query;

conduct keyword searching on the keywords; and

return results of the keyword matching.

70.   A search engine, embodied on the computer-readable medium, comprising the computer-executable instructions of claim 68.

71.   An information retrieval program, embodied on the computer-readable medium, comprising the computer-executable instructions of claim 68.